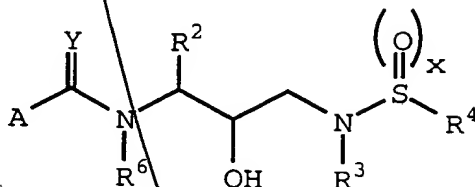


WHAT IS CLAIMED IS:

1. A compound represented by the formula:



or a pharmaceutically acceptable salt, prodrug or ester thereof, wherein

- 10 R² is an alkyl, aryl, cycloalkyl, cycloalkylalkyl or aralkyl radical, which radical is optionally substituted with a radical selected from the group consisting of alkyl, halo, nitro, cyano, CF₃, -OR⁹, and -SR⁹, wherein R⁹ is a radical selected from the group consisting of

15 hydrogen and alkyl;

R³ is a hydrogen, alkyl, haloalkyl, alkenyl, alkynyl, hydroxyalkyl, alkoxyalkyl, alkylthioalkyl, alkylsulfonylalkyl, cycloalkyl, cycloalkylalkyl,

- 20 heterocycloalkyl, heteroaryl, heterocycloalkylalkyl,
aryl, aralkyl, heteroaralkyl, aminoalkyl or mono- or
disubstituted aminoalkyl radicals, wherein said
substituents are selected from the group consisting of
alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl,
25 heteroaryl, heteroaralkyl, heterocycloalkyl and
heterocycloalkylalkyl radicals; or where said aminoalkyl
radical is disubstituted, said substituents along with
the nitrogen atom to which they are attached, form a
heterocycloalkyl or a heteroaryl radical;

30

R⁴ is an alkyl, haloalkyl, alkenyl, alkynyl, hydroxyalkyl, alkoxyalkyl, cycloalkyl, cycloalkylalkyl, heterocycloalkyl, heteroaryl, heterocycloalkylalkyl, aryl, aralkyl, aralkenyl, heteroaralkyl, aminoalkyl or

mono- or disubstituted aminoalkyl radical, wherein said substituents are selected from the group consisting of alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heteroaryl, heteroaralkyl, heterocycloalkyl and

5 heterocycloalkylalkyl radicals; or where said aminoalkyl radical is disubstituted, said substituents along with the nitrogen atom to which they are attached, form a heterocycloalkyl or a heteroaryl radical;

10 R⁶ is a hydrogen or alkyl radical;

x is 1 or 2;

t is 0 or 1; and

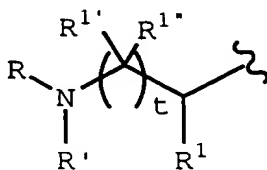
15

Y is O or S; and

A is an alkoxy, alkenoxy, aralkoxy, alkyl, cycloalkyl, cycloalkylalkoxy, cycloalkylalkyl, aralkyl, aryl,

20 aryloxy, heterocycloalkyl, heterocycloalkoxy, heterocycloalkylalkyl, heterocycloalkylalkoxy, heteroaralkyl, heteroaralkoxy, heteroaryloxy, heteroaryl, alkenyl, aryloxyalkyl, heteroaryloxyalkyl, hydroxyalkyl, amino, or mono- or disubstituted amino radical, wherein

25 the substituents are selected from the group consisting of alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heteroaryl, heteroaralkyl, heterocycloalkyl and heterocycloalkylalkyl radicals; or where said amino radical is disubstituted, said substituents along with
30 the nitrogen atom to which they are attached form a heterocycloalkyl or heteroaryl radical; or is represented by the formula



defined for R^3 or R

defined for R^3 or R

R¹ is a hydrogen, -CO₂CH₃, -CH₂CO₂CH₃, -CO₂H, -CH₂CO₂H, -CH₂CH₂CONH₂, -CH₂CONH₂, -CONH₂, -CH₂C(O)NHCH₃,
30 -CH₂C(O)N(CH₃)₂, -CONHCH₃, -CONH(CH₃)₂, -CH₂SO₂NH₂, -CH₂CH₂SO₂NH₂, -CH₂S[O]CH₃, -CH₂S[O]₂CH₃, -C(CH₃)₂(SCH₃), -C(CH₃)₂(S[O]CH₃), -C(CH₃)₂(S[O]₂CH₃), alkyl, hydroxyalkyl, cyanoalkyl, haloalkyl, alkenyl, alkynyl, cycloalkyl, cycloalkylalkyl, alkylthioalkyl, aralkyl,
35 heteroaralkyl, aminoalkyl or mono- or disubstituted aminoalkyl radical, wherein said substituents are selected from the group consisting of alkyl, aryl,

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heterocycloalkyl, heteroaryl, heterocycloalkylalkyl,
aryl, aralkyl, aralkenyl or heteroaralkyl radical;

R⁶ is a hydrogen or alkyl radical;

5

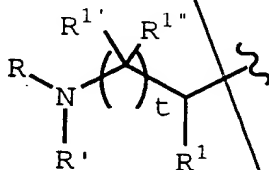
x is 1 or 2;

t is 0 or 1; and

10 Y is O or S; and

A is an alkoxy, alkenoxy, aralkoxy, alkyl, cycloalkyl,
cycloalkylalkoxy, cycloalkylalkyl, aralkyl, aryl,
aryloxy, heterocycloalkyl, heterocycloalkoxy,
15 heterocycloalkylalkyl, heterocycloalkylalkoxy,
heteroaralkyl, heteroaralkoxy, heteroaryloxy, heteroaryl,
hydroxyalkyl, amino, or mono- or disubstituted amino
radical, wherein the substituents are selected from the
group consisting of alkyl, aralkyl, heteroaryl,
20 heteroaralkyl, heterocycloalkyl and heterocycloalkylalkyl
radicals; or where said amino radical is disubstituted,
said substituents along with the nitrogen atom to which
they are attached form a heterocycloalkyl radical; or is
represented by the formula

25



wherein R is a hydrogen, alkoxycarbonyl,
aralkoxycarbonyl, alkylcarbonyl, carboxyalkanoyl,
30 alkanoyl, aralkanoyl, aroyl, heterocyclylcarbonyl,
heterocyclloxycarbonyl, heterocyclylalkanoyl,
heterocyclylalkoxycarbonyl, heteroaralkanoyl,
heteroaralkoxycarbonyl, heteroaryloxy-carbonyl,
heteroaroyl, alkyl, cycloalkyl, aralkyl, hydroxyalkyl,
35 aminocarbonyl, aminoalkanoyl, or mono- or disubstituted

R² is an alkyl, aryl, cycloalkyl, cycloalkylalkyl or aralkyl radical, which radical is optionally substituted with a radical selected from the group consisting of alkyl, halo and -OR⁹, wherein R⁹ is a radical selected from the group consisting of hydrogen and alkyl;

R³ is a hydrogen, alkyl, haloalkyl, alkenyl, alkynyl, hydroxyalkyl, alkoxyalkyl, alkylthioalkyl, alkylsulfonylalkyl, cycloalkyl, cycloalkylalkyl, heterocycloalkyl, heteroaryl, heterocycloalkylalkyl, aryl, aralkyl, heteroaralkyl, aminoalkyl or mono- or dialkyl substituted aminoalkyl radical;

15 R⁴ is an alkyl, haloalkyl, alkenyl, alkynyl, hydroxyalkyl, alkoxyalkyl, cycloalkyl, cycloalkylalkyl, heterocycloalkyl, heteroaryl, heterocycloalkylalkyl, aryl, aralkyl, aralkenyl or heteroaralkyl radical;

20 R⁶ is a hydrogen or alkyl radical;

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x is 1 or 2;
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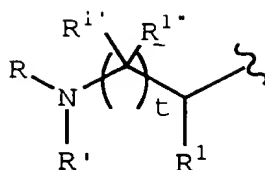
t is 0 or 1; and

Y is 0 or S; and

A is an alkoxy, alkenoxy, aralkoxy, alkyl, cycloalkyl, aryl, heterocycloalkyl, heterocycloalkoxy, heterocycloalkylalkyl, heteroaralkoxy, heteroaryl, amino, or mono- or disubstituted amino radical, wherein the substituents are selected from the group consisting of alkyl and aralkyl radicals; or is represented by the formula

35

253



wherein R is a hydrogen, alkoxycarbonyl, aralkoxycarbonyl, alkylcarbonyl, carboxyalkanoyl, alkanoyl, aroyl, heteroaroyl, alkyl, aralkyl, aminocarbonyl, aminoalkanoyl, or mono- or disubstituted aminocarbonyl or mono- or disubstituted aminoalkanoyl radical, wherein the substituents are selected from the group consisting of alkyl and aralkyl radicals;

R' is a hydrogen, alkyl or aralkyl radical or R"SO₂-, wherein R" is a radical as defined for R³; or R and R' together with the nitrogen to which they are attached form a heterocycloalkyl or heteroaryl radical;

R¹ is a hydrogen, -CO₂CH₃, -CH₂CO₂CH₃, -CO₂H, -CH₂CO₂H, -CH₂CH₂CONH₂, -CH₂CONH₂, -CONH₂, -CH₂C(O)NHCH₃, -CH₂C(O)N(CH₃)₂, -CONHCH₃, -CONH(CH₃)₂, -CH₂SO₂NH₂, -CH₂CH₂SO₂NH₂, -CH₂S[O]CH₃, -CH₂S[O]₂CH₃, -C(CH₃)₂(SCH₃), -C(CH₃)₂(S[O]CH₃), -C(CH₃)₂(S[O]₂CH₃), alkyl, hydroxyalkyl, cyanoalkyl, haloalkyl, alkenyl, alkynyl, cycloalkyl, cycloalkylalkyl, alkylthioalkyl, aralkyl, heteroaralkyl, aminoalkyl or mono- or disubstituted aminoalkyl radical, wherein said substituents are selected from the group consisting of alkyl and aralkyl radicals; and

R¹' is a hydrogen, alkyl or aralkyl; and R¹" is a hydrogen, alkyl, -CO₂CH₃ or -CONH₂; or one of R¹' and R¹" together with R¹ and the carbon atoms to which R¹, R¹' and R¹" are attached, form a cycloalkyl radical.

4. The compound of Claim 3 or a pharmaceutically acceptable salt, prodrug or ester thereof, wherein

wherein R is a hydrogen, alkoxycarbonyl, aralkoxycarbonyl, alkylcarbonyl, carboxyalkanoyl, alkanoyl, aroyl, heteroaroyl, alkyl, aralkyl, aminocarbonyl, aminoalkanoyl, or mono- or disubstituted aminocarbonyl or mono- or disubstituted aminoalkanoyl radical, wherein the substituents are selected from the group consisting of alkyl and aralkyl radicals;

10 R' is a hydrogen, alkyl or aralkyl radical or $R''SO_2-$, wherein R'' is a radical as defined for R³; or R and R' together with the nitrogen to which they are attached form a heterocycloalkyl or heteroaryl radical;

15 R¹ is a hydrogen, -CO₂H, -CH₂CO₂H, -CH₂CH₂CONH₂,
-CH₂CONH₂, -CONH₂, -CH₂C(O)NHCH₃, -CH₂C(O)N(CH₃)₂,
-CONHCH₃, -CONH(CH₃)₂, -CH₂SO₂NH₂, -CH₂CH₂SO₂NH₂, alkyl,
hydroxyalkyl, cyanoalkyl, alkynyl, cycloalkylalkyl,
alkylthioalkyl, aralkyl or heteroaralkyl radical; and

20 R^{1'} is a hydrogen, alkyl or aralkyl; and R^{1''} is a hydrogen, alkyl, -CO₂CH₃ or -CONH₂; or one of R^{1'} and R^{1''} together with R¹ and the carbon atoms to which R¹, R^{1'} and R^{1''} are attached, form a cycloalkyl radical;

25 with the proviso that alkyl, alone or in combination, is
a straight-chain or branched-chain hydrocarbon radical
containing from one to eight carbon atoms; alkenyl, alone
or in combination, is a straight-chain or branched-chain
30 hydrocarbon radical having at least one double bond and
containing from two to eight carbon atoms; alkynyl, alone
or in combination, is a straight-chain or branched-chain
hydrocarbon radical having at least one triple bond and
containing from two to ten carbon atoms; and cycloalkyl,
35 alone or in combination, is a hydrocarbon ring containing
from three to eight carbon atoms.

5. The compound of Claim 4 or a pharmaceutically acceptable salt, prodrug or ester thereof, wherein

5 R² is an alkyl, cycloalkylalkyl or aralkyl radical, which radical is optionally substituted with a radical selected from the group consisting of alkyl, halo and -OR⁹, wherein R⁹ is a radical selected from the group consisting of hydrogen and alkyl;

10 R³ is a hydrogen, alkyl, alkenyl, alkynyl, hydroxyalkyl, alkoxyalkyl, alkylthioalkyl, alkylsulfonylalkyl, cycloalkyl, cycloalkylalkyl, heterocycloalkylalkyl, aryl, aralkyl, heteroaralkyl, aminoalkyl or mono- or dialkyl substituted aminoalkyl radical;

15 R⁴ is an alkyl, haloalkyl, alkenyl, alkynyl, hydroxyalkyl, alkoxyalkyl, cycloalkyl, cycloalkylalkyl, heterocycloalkyl, heteroaryl, heterocycloalkylalkyl, aryl, aralkyl, aralkenyl or heteroaralkyl radical;

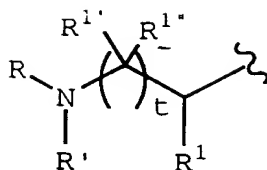
20 R⁶ is a hydrogen or alkyl radical;

x is 1 or 2;

25 t is 0 or 1; and

Y is O or S; and

30 A is an alkoxy, alkenoxy, aralkoxy, alkyl, cycloalkyl, aryl, heterocycloalkyl, heterocycloalkoxy, heterocycloalkylalkyl, heteroaralkoxy, heteroaryl, amino, or mono- or disubstituted amino radical, wherein the substituents are selected from the group consisting of alkyl and aralkyl radicals; or is represented by the
35 formula



wherein R is a hydrogen, alkoxycarbonyl, aralkoxycarbonyl, alkylcarbonyl, carboxyalkanoyl, alkanoyl, aroyl, heteroaroyl, alkyl, aralkyl, aminocarbonyl, aminoalkanoyl, or mono- or disubstituted aminocarbonyl or mono- or disubstituted aminoalkanoyl radical, wherein the substituents are selected from the group consisting of alkyl and aralkyl radicals;

R' is a hydrogen, alkyl or aralkyl radical or R"SO₂-, wherein R" is a radical as defined for R³; or R and R' together with the nitrogen to which they are attached form a heterocycloalkyl or heteroaryl radical;

R¹ is a hydrogen, -CO₂H, -CH₂CO₂H, -CH₂CH₂CONH₂, -CH₂CONH₂, -CONH₂, -CH₂C(O)NHCH₃, -CH₂C(O)N(CH₃)₂, -CONHCH₃, -CONH(CH₃)₂, -CH₂SO₂NH₂, -CH₂CH₂SO₂NH₂, alkyl, hydroxyalkyl, cyanoalkyl, alkynyl, cycloalkylalkyl, alkylthioalkyl, aralkyl or heteroaralkyl radical; and

R¹' is a hydrogen, alkyl or aralkyl; and R¹" is a hydrogen, alkyl, -CO₂CH₃ or -CONH₂; or one of R¹' and R¹" together with R¹ and the carbon atoms to which R¹, R¹' and R¹" are attached, form a cycloalkyl radical;

with the proviso that alkyl, alone or in combination, is a straight-chain or branched-chain hydrocarbon radical containing from one to five carbon atoms; alkenyl, alone or in combination, is a straight-chain or branched-chain hydrocarbon radical having at least one double bond and containing from two to five carbon atoms; alkynyl, alone or in combination, is a straight-chain or branched-chain hydrocarbon radical having at least one triple bond and

containing from two to five carbon atoms; and cycloalkyl, alone or in combination, is a hydrocarbon ring containing from three to eight carbon atoms; and

5 with the proviso that when R² is cycloalkylalkyl and t is
0, R' is a group other than alkoxy carbonyl.

6. The compound of Claim 5 or a pharmaceutically acceptable salt, prodrug or ester thereof, wherein

10 R² is butyl, cyclohexylmethyl, benzyl, 4-fluorobenzyl or naphthylmethyl;

R³ is methyl, ethyl, propyl, butyl, pentyl, hexyl, iso-butyl, iso-amyl, 3-methoxypropyl, 3-methylthiopropyl, 4-methylthiobutyl, 4-methylsulfonylbutyl, 2-dimethylaminoethyl, 2-(1-morpholino)ethyl, 4-hydroxybutyl, allyl, propargyl, cyclohexylmethyl, cyclopropylmethyl, phenyl, benzyl, 4-fluorobenzyl, 4-methoxybenzyl, 1-phenylethyl, 2-phenylethyl, naphthylmethyl, 3-pyridylmethyl or 4-pyridylmethyl;

R4 is methyl, ethyl, propyl, butyl, ethenyl,
chloromethyl, cyclopropyl, cyclobutyl, cyclopentyl,
25 cyclohexyl, phenyl, naphthyl, chlorophenyl, fluorophenyl,
hydroxyphenyl, methylphenyl, methoxyphenyl, ethoxyphenyl,
methylthiophenyl, methylsulfoxyphenyl,
methylsulfonylphenyl, acetamidophenyl,
methoxycarbonylphenyl, dimethylaminophenyl, nitrophenyl,
30 trifluoromethylphenyl, benzyl, 2-phenylethenyl or
thienyl;

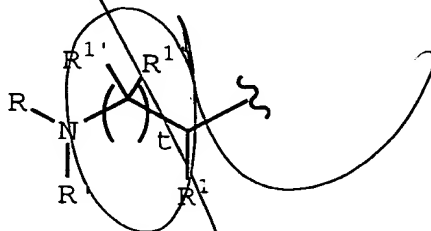
R6 is hydrogen;

35 x is 2;

t is 0 or 1; and

Y is O, and

A is methyl, cyclohexyl, cyclopentyl, cycloheptyl,
 5 1,2,3,4-tetrahydronaphthyl, naphthyl, quinolinyl,
 indolyl, pyridyl, methylpyridyl, furanyl, thiophenyl,
 oxazolyl, thiazolyl, phenyl, methylphenyl, ethylphenyl,
 dimethylphenyl, iso-propylphenyl, chlorophenyl,
 hydroxyphenyl, methoxyphenyl, methylsulfonylphenyl,
 10 methylsulfonylmethylphenyl, carboxyphenyl,
 aminocarbonylphenyl, methylhydroxyphenyl,
 methylnitrophenyl, methylaminophenyl, methyl-N,N-
 dimethylaminophenyl, t-butoxy, benzyloxy, pyridylmethoxy,
 3-propenoxy, hydroxypyridylmethoxy, aminopyridylmethoxy,
 15 pyrimidinylmethoxy, N-oxo-pyrimidinylmethoxy,
 thiazolylmethoxy, tetrahydrothiophenoxy, 1,1-
 dioxotetrahydrothiophenoxy, tetrahydrofuranoxo,
 methylamino, benzylamino or isopropylamino; or is
 represented by the formula



wherein R is hydrogen, acetyl, phenoxyacetyl,
 methoxyacetyl, naphthaloxyacetyl, succinoyl, 2-
 25 methylpropionoyl, 2-hydroxypropionoyl, t-butoxycarbonyl,
 benzyloxycarbonyl, methoxybenzyloxycarbonyl,
 aminocarbonyl, quinolinylcarbonyl, N-methylglycinyll or
 N,N-dimethylglycinyll;

30 R' is hydrogen, benzyl or methyl; or R and R' together
 with the nitrogen to which they are attached form
 pyrrolyl;

R1 is hydrogen, -CO₂H, -CH₂CO₂H, -CH₂CH₂CONH₂, -CH₂CONH₂,
 35 -CONH₂, -CH₂C(O)NHCH₃, -CH₂C(O)N(CH₃)₂, -CONHCH₃,

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-CONH(CH₃)₂, -CH₂SO₂NH₂, -CH₂CH₂SO₂NH₂, methyl, ethyl, propyl, isopropyl, butyl, isobutyl, sec-butyl, tert-butyl, 3-methylbutyl, cyclohexylmethyl, benzyl, hydroxybenzyl, imidazolyl, imidazolymethyl, cyanomethyl, methylthiomethyl, propargyl or hydroxyethyl; and

R¹' is hydrogen, methyl, ethyl, propyl, isopropyl, butyl, isobutyl, benzyl, phenylethyl, phenylpropyl, phenylbutyl or 4,4-diphenylbutyl; and R¹" is hydrogen, methyl, -CO₂CH₃ or -CONH₂; or one of R¹' and R¹" together with R¹ and the carbon atoms to which R¹, R¹' and R¹" are attached, form cyclobutyl, cyclopentyl or cyclohexyl;

with the proviso that when R² is cyclohexylmethyl and t is 0, R' is a group other than t-butoxycarbonyl.

7. The compound of Claim 1 which is:

Phenylmethyl[2R-hydroxy-3-[(3-methylbutyl) (methylsulfonyl) amino]-1S-(phenylmethyl)propyl]carbamate;

Phenylmethyl[2R-hydroxy-3-[(3-methylbutyl) (phenylsulfonyl) amino]-1S-(phenylmethyl)propyl]carbamate;

N1-[2R-hydroxy-3-[(3-methylbutyl) (methylsulfonyl) amino]-1S-(phenylmethyl)propyl]-2S-[(2-quinolinylcarbonyl) amino] butanediamide;

N1-[2R-hydroxy-3-[(3-methylbutyl) (methylsulfonyl) amino]-1S-(phenylmethyl)propyl]-2S-[(phenylmethyloxycarbonyl) amino] butanediamide;

N1-[2R-hydroxy-3-[(3-methylbutyl) (phenylsulfonyl) amino]-1S-(phenylmethyl)propyl]-2S-[(2-quinolinylcarbonyl) amino] butanediamide;

- N1-[2R-hydroxy-3-[(3-methylbutyl)(phenylsulfonyl)amino]-1S-(phenylmethyl)propyl]-2S-[(phenylmethyloxycarbonyl)amino]butanediamide;
- 5 2S-[[[(dimethylamino)acetyl]amino]-N-[2R-hydroxy-3-[(3-methyl-butyl)(phenylsulfonyl)amino]-1S-(phenylmethyl)propyl]-3,3-dimethylbutaneamide;
- 10 2S-[[[(methylamino)acetyl]amino]-N-[2R-hydroxy-3-[(3-methyl-butyl)(phenylsulfonyl)amino]-1S-(phenylmethyl)propyl]-3,3-dimethylbutaneamide;
- N1-[2R-hydroxy-3-[(3-methylbutyl)(phenyl-sulfonyl)amino]-N4-methyl-1S-(phenylmethyl)propyl]-2S-[(2-quinolinylcarbonyl)amino]butanediamide;
- 15 N1-[2R-hydroxy-3-[(3-methylbutyl)-N-(phenylsulfonyl)amino]-1-(phenylmethyl)propyl]amino]-2-methyl-3-oxopropyl]-, (4-methoxyphenyl)methyl ester, [1S-[1R*(S*),2S*]]-;
- 20 Carbamic acid, [2R-hydroxy-3-[(4-hydroxyphenylsulfonyl)(2-methylpropyl)amino]-1S-(phenylmethyl)propyl-, 3(S)-1,1-dioxotetrahydrothiophen-3-yl-ester;
- 25 Carbamic acid, [2R-hydroxy-3-[(4-methoxyphenylsulfonyl)(2-methylpropyl)amino]-1S-(phenylmethyl)propyl-, 3(S)-1,1-dioxotetrahydrothiophen-3-yl-ester;
- 30 Carbamic acid, [2R-hydroxy-3-[(4-methoxyphenylsulfonyl)(2-methylpropyl)amino]-1S-(phenylmethyl)propyl-, 3-S-tetrahydrothiophen-3-yl-ester;
- 35 Carbamic acid, [2R-hydroxy-3-[(4-hydroxyphenylsulfonyl)(2-methylpropyl)amino]-1S-(phenylmethyl)propyl-, 3-S-tetrahydrothiophen-3-yl-ester;

Carbamic acid, [2R-hydroxy-3-[(4-hydroxyphenylsulfonyl) (2-methylpropyl) amino]-1S-(phenylmethyl)propyl-, 3-S-tetrahydrofuran-3-yl-ester;

- 5 Carbamic acid, [2R-hydroxy-3-[(4-methoxyphenylsulfonyl)
(2-methylpropyl)amino]-1S-(phenylmethyl)propyl-, 3-S-
tetrahydrofuran-3-yl-ester;

Carbamic acid, [2R-hydroxy-3-[[[4-methoxyphenyl)sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-, 5-(thiazolyl)methyl ester;

Carbamic acid, [2R-hydroxy-3-[[(4-
hydroxyphenyl) sulfonyl] (2-methylpropyl) amino] -1S-
15 (phenylmethyl) propyl]-, 5-(thiazolyl) methyl ester;

Benzamide, N-[2R-hydroxy-3-[[(4-hydroxyphenyl)sulfonyl] (2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-2-methyl;

Carbamic acid, [2R-hydroxy-3-[[[(4-methoxyphenyl)sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-, 3-(6-aminopyridyl)methyl ester;

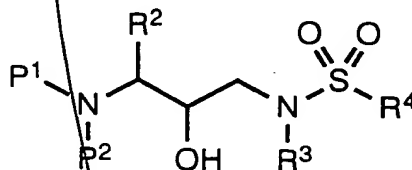
25 Carbamic acid, [2R-hydroxy-3-[[[4-
hydroxyphenyl)sulfonyl](2-methylpropyl)amino]-1S-
(phenylmethyl)propyl]-, 3-(6-aminopyridyl)methyl ester;

30 Carbamic acid, [2R-hydroxy-3-[[[(4-methoxyphenyl)sulfonyl]
(2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-, 3-(6-
hydroxypyridyl)methyl ester;

Carbamic acid, [2R-hydroxy-3-[[[(4-hydroxyphenyl)sulfonyl]
(2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-, 5-
35 pyrimidylmethyl ester; or

Benzamide, N-[2R-hydroxy-3-[[[(4-methoxyphenyl)sulfonyl]
(2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-2-methyl.

8. A compound represented by the formula:



or a pharmaceutically acceptable salt, prodrug or ester thereof, wherein

each of P¹ and P² independently represent hydrogen, alkoxy carbonyl, aralkoxy carbonyl, alkyl carbonyl, cycloalkyl carbonyl, cycloalkyl alkoxy carbonyl, cycloalkyl alkanoyl, alkanoyl, aralkanoyl, aroyl, aryloxy carbonyl, aryloxy carbonyl alkyl, aryloxy alkanoyl, heterocyclyl carbonyl, heterocyclyloxy carbonyl, heterocyclyl alkanoyl, heterocyclyl alkoxy carbonyl, heteroaralkanoyl, heteroaralkoxy carbonyl, heteroaryloxy carbonyl, heteroaroyl, alkyl, alkenyl, cycloalkyl, aryl, aralkyl, aryloxy alkyl, heteroaryloxy alkyl, hydroxy alkyl, aminocarbonyl, amino alkanoyl, or mono- or disubstituted aminocarbonyl or mono- or disubstituted amino alkanoyl radical, wherein the substituents are selected from the group consisting of alkyl, aryl, aralkyl, cycloalkyl, cycloalkyl alkyl, heteroaryl, heteroaralkyl, heterocycloalkyl and heterocycloalkyl radicals; or where said amino alkanoyl radical is disubstituted, said substituents along with the nitrogen atom to which they are attached form a heterocycloalkyl or heteroaryl radical;

R² is an alkyl, aryl, cycloalkyl, cycloalkyl alkyl or aralkyl radical, which radicals are optionally substituted with a group selected from alkyl and halogen

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Sub 1

radicals, nitro, cyano, CF_3 , $-\text{OR}^9$, $-\text{SR}^9$, wherein R^9 is a hydrogen or alkyl radical;

5 R^3 is a hydrogen, alkyl, haloalkyl, alkenyl, alkynyl, hydroxyalkyl, alkoxyalkyl, cycloalkyl, cycloalkylalkyl, heterocycloalkyl, heteroaryl, heterocycloalkylalkyl, aryl, aralkyl, heteroaralkyl, aminoalkyl or mono- or disubstituted aminoalkyl radical, wherein said substituents are selected from the group consisting of
10 alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heteroaryl, heteroaralkyl, heterocycloalkyl and heterocycloalkylalkyl radicals; or where the aminoalkyl radical is disubstituted, said substituents along with the nitrogen atom to which they are attached, form a
15 heterocycloalkyl or a heteroaryl radical; and

R^4 is a radical as defined by R^3 except for hydrogen.

9. The compound of Claim 8, wherein each of P^1 and
20 P^2 independently represent a hydrogen, alkoxycarbonyl, aralkyloxycarbonyl, heteroaralkyloxycarbonyl, aroyl, heteroaroyl, alkanoyl or cycloalkanoyl radical;

25 R^2 is a cycloalkylalkyl, aralkyl or alkyl radical;

R^3 is an alkyl, cycloalkyl or cycloalkylalkyl radical; and

30 R^4 is an aryl, alkyl, heteroaryl or aryl radical.

10. The compound of Claim 9, wherein P^1 and P^2 independently represent 3-pyridylmethyloxycarbonyl, 3-pyridylmethyloxycarbonyl N-oxide, 4-pyridylmethyloxycarbonyl, 4-pyridylmethyloxycarbonyl N-oxide, 5-pyrimidylmethyloxycarbonyl, tert-butylloxycarbonyl, allyloxycarbonyl, 2-propyloxycarbonyl, benzyloxycarbonyl, cycloheptylcarbonyl,

35

5 dimethylbenzoyl or 2,5-dimethylbenzoyl;

fluorobenzyl, para-methoxybenzyl, isobutyl or n-butyl;

butyl or n-propyl; and

15 fluorophenyl, 2-naphthyl, 3-pyridyl, 3-pyridyl N-oxide,
4-pyridyl or 4-pyridyl N-oxide;

20 tert-butyloxycarbonyl.

11. A compound of Claim 8 which is:

25 (phenylsulfonyl)amino]-1S-(phenylmethyl)propyl]carbamate;

propyl] carbamate;

propyl] carbamate;

nitrophenylsulfonyl) amino] -1S-
(phenylmethyl) propyl] carbamate;

Phenylmethyl[2R-hydroxy-3-[(2-methylpropyl)(4-acetamidophenylsulfonyl)amino]-1S-(phenylmethyl)propyl]carbamate;

10

15

roxy-3-[(phenylme
roxy-3-[(phenylme

3-methyl
thyl)prop

25

30

Phenylmethyl[2R-hydroxy-3-[(2-methylpropyl)(4-fluorophenylsulfonyl)amino]-1S-(4-fluorophenylmethyl)propyl]carbamate;

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1S-(phenylmethyl)propyl] carbamate;

35 [2R-hydroxy-3-[(phenylsulfonyl)(cyclohexylmethyl)amino]-
1S-(phenylmethyl)propylamine;

[2R-hydroxy-3-[[phenylsulfonyl](cyclohexyl)amino]-1S-(phenylmethyl)propyl]amine;

4-Pyridinecarboxamide, N-[2R-hydroxy-3-[[[4-methoxyphenyl)sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl];

Benzamide, N-[2R-hydroxy-3-[[[4-methoxyphenyl)sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-2,6-dimethyl;

Benzamide, N-[2R-hydroxy-3-[[[4-methoxyphenyl)sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-2-methyl;

Benzamide, N-[2R-hydroxy-3-[[[4-methoxyphenyl)sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-2-ethyl;

Benzamide, N-[2R-hydroxy-3-[[[4-methoxyphenyl)sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-2-chloro;

Carbamic acid, [2R-hydroxy-3-[[[4-methoxyphenyl)sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-, 3-pyridylmethyl ester;

Carbamic acid, [2R-hydroxy-3-[[[4-methoxyphenyl)sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-, 3-pyridylmethyl ester, N-oxide;

Carbamic acid, [2R-hydroxy-3-[[phenylsulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-, 3-pyridylmethyl ester;

Carbamic acid, [2R-hydroxy-3-[[[4-methoxyphenyl)sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-, 4-pyridylmethyl ester;

Carbamic acid, [2R-hydroxy-3-[[[4-methoxyphenyl)sulfonyl]
(2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-, 4-
pyridylmethyl ester, N-oxide;

- 5 Carbamic acid, [2R-hydroxy-3-[[[4-chlorophenyl)sulfonyl]
(2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-, 3-
pyridylmethyl ester;

- 10 Carbamic acid, [2R-hydroxy-3-[[[4-nitrophenyl)sulfonyl]
(2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-, 3-
pyridylmethyl ester;

- 15 Carbamic acid, [2R-hydroxy-3-[[[4-fluorophenyl)sulfonyl]
(2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-, 3-
pyridylmethyl ester;

- 20 Carbamic acid, [2R-hydroxy-3-[[[4-hydroxyphenyl)sulfonyl]
(2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-, 3-
pyridylmethyl ester; or

Carbamic acid, [2R-hydroxy-3-[[[4-methoxyphenyl)sulfonyl]
(2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-, 5-
pyrimidylmethyl ester.

- 25 12. A compound of Claim 8 which is:

Carbamic acid, [2R-hydroxy-3-[[[4-methoxyphenyl)sulfonyl]
(methylpropyl)amino]-1S-(phenylmethyl)propyl]-, 5-
thiazolylmethyl ester;

- 30 Carbamic acid, [2R-hydroxy-3-[[[4-hydroxyphenyl)sulfonyl]
(2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-, 5-
thiazolylmethyl ester;

- 35 Carbamic acid, [2R-hydroxy-3-[[[4-methoxyphenyl)sulfonyl]
(2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-, 3-
furanylmethyl ester;

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Carbamic acid, 2R-hydroxy-3-[[(3-aminophenyl)sulfonyl] (2-methylpropyl)amino]-1S-(phenylmethyl)propyl-, 5-thiazolylmethyl ester;

- Benzamide, N-[2R-hydroxy-3-[[[(3-aminophenyl)sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-3-hydroxy-2-methyl;
- 5 Carbamic acid, 2R-hydroxy-3-[[[(2-amino benzothiazol-5-yl)sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl-, phenylmethyl ester;
- 10 Carbamic acid, 2R-hydroxy-3-[[[(2-aminobenzothiazol-7-yl)sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl-, phenylmethyl ester;
- 15 2R-hydroxy-3-[[[(2,3-dihydrobenzofuran-5-yl)sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl) propylamine;
- 20 Carbamic acid, [2R-hydroxy-3-[[[(2,3-dihydrobenzofuran-5-yl)sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl) propyl-, 3-pyridylmethyl ester;
- 25 Carbamic acid, [2R-hydroxy-3-[[[(2,3-dihydrobenzofuran-5-yl)sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl) propyl-, 5-thiazolylmethyl ester;
- 30 Benzamide, N-[2R-hydroxy-3-[[[(2,3-dihydrobenzofuran-5-yl)sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-3-amino-2-methyl-;
- 35 2R-hydroxy-3-[[[(1,3-benzodioxol-5-yl)sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl) propylamine;
- Carbamic acid, 2R-hydroxy-3-[[[(1,3-benzodioxol-5-yl)sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl-, 3-pyridylmethyl ester;

Carbamic acid, 2R-hydroxy-3-[[[(1,3-benzodioxol-5-yl) sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-, 5-thiazolylmethyl ester;

5 Benzamide, N-[2R-hydroxy-3-[[[(1,3-benzodioxol-5-yl) sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-3-amino-2-methyl;

10 Benzamide, N-[2R-hydroxy-3-[[[(1,3-benzodioxol-5-yl) sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-4-hydroxy-2-methyl;

15 Benzamide, N-[2R-hydroxy-3-[[[(1,3-benzodioxol-5-yl) sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-3-hydroxy-2-methyl;

20 N-[2R-hydroxy-3-[[[(4-methoxyphenyl) sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-(2,6-dimethylphenoxy)acetamide;

N-[2R-hydroxy-3-[[[(4-methoxyphenyl) sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-(2-methylphenoxy)acetamide;

25 N-[2R-hydroxy-3-[[[(4-methoxyphenyl) sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-2-(2,6-dimethylphenylamino)acetamide; or

30 N-[2R-hydroxy-3-[[[(4-methoxyphenyl) sulfonyl](2-methylpropyl)amino]-1S-(phenylmethyl)propyl]-2-amino-benzothiazole-6-carboxamide.

35 13. A pharmaceutical composition comprising a compound of Claim 1 and a pharmaceutically acceptable carrier.

14. A pharmaceutical composition comprising a compound of Claim 8 and a pharmaceutically acceptable carrier.

5 15. Method of inhibiting a retroviral protease comprising administering an effective amount of a compound of Claim 1.

10 16. Method of inhibiting a retroviral protease comprising administering an effective amount of a compound of Claim 8.

15 17. Method of treating a retroviral infection comprising administering an effective amount of a composition of Claim 13.

20 18. Method of treating a retroviral infection comprising administering an effective amount of a composition of Claim 14.

25 19. Method of preventing replication of a retrovirus comprising administering an effective amount of a compound of Claim 1.

20. Method of preventing replication of a retrovirus comprising administering an effective amount of a compound of Claim 8.

add A³
add B²